DETAILED ACTION

Claims 1 – 10 are presented for examination.

Specification

1. The disclosure is objected to because of the following informalities:

Page 5, paragraph 4: references to Figure 2 include numbered items found in Figure 1, but not in Figure 2. Items in Figure 1 should be clearly identified as such when recited in the specification.

Page 6, paragraph 3, bottom of page: references to phase failure detector 1 not clearly identified as belonging to Figure 1. Items in Figures 1 - 5 should be clearly identified by the figure to which they belong when recited in the specification.

Appropriate correction is required.

Claim Objections

2. Claims 4 – 10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, claims 4 – 10 not been further treated on the merits.

Claim Rejections - 35 USC § 103

3. Claims 1 – 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akhmedov et al. (Soviet Union Patent SU 1332448 A1, published 23 August, 1985, hereinafter referred to as Akhmedov), and further in view of Compton (US Patent 3,999,087, December 21, 1976, hereinafter referred to as Compton).

4. As for claim 1, Akhmedov discloses a phase fault detection apparatus having substantial features of the claimed invention. Specifically, Akhmedov discloses an apparatus having:

A detector circuit for each phase [claim 1] (Abstract; Figure, item 1);

Which detector circuit has a first connection point for connecting to the phase being monitored [claim 1] (Abstract; Figure, connections between lines A, B, C and item 1);

A second connection point, which is connected to a common connection point (9) of the detector circuits [claim 1] (Abstract; item 1);

Each detector circuit includes voltage divider elements for dividing voltage between the first and the second connection point and for feeding reduced voltage to an input point [claim 1] (Abstract; Item 1);

A trigger and detector circuit connected between the reduced voltage input point and the second connection point [claim 1] (Abstract; items 1, 16 - 25).

Although Akhmedov discloses substantial features of the claimed invention, Akhmedov does not disclose an apparatus having:

Each trigger and detector circuit is arranged to produce a detection pulse when the reduced voltage reaches a trigger value [claim 1].

Nonetheless these features are well known in the art, and would have been an obvious modification to the apparatus disclosed by Akhmedov, as evidenced by Compton. In an analogous art, Compton discloses a missing phase detector circuit for use with three phase power sources having:

Each trigger and detector circuit is arranged to produce a detection pulse when the reduced voltage reaches a trigger value [claim 1] (Abstract; Figure 2, items 21A, B, C, items 16 A, B, C, item 32, outputs to control circuitry) in order to signal single or multiple phase failures or faults to automatic data processing or alarm systems. Given the teaching of Compton, a person of ordinary skill in the art at the time of the invention would have readily recognized the desirability of modifying Akhmedov by employing well known detector and pulse forming circuits, such as those disclosed by Compton, in order to detect phase failures in polyphase alternating current equipment and systems, and for the purposes discussed above.

5. As for claim 2, Akhmedov discloses an apparatus having:

Voltage divider elements include at least two capacitive elements which participate in the division of the voltage and of which at least one is arranged to store energy and to discharge the energy it stores through the trigger and detector circuit [claim 2] (Abstract; Figure, item 1, containing three capacitive ac voltage dividers, each connected to a different phase).

6. As to claim 3, although Akhmedov discloses an apparatus having substantial features of the claimed invention, as discussed in paragraph 4 above, Akhmedov does not disclose :

The phase failure detector includes a resistive element between the capacitive elements and the first connection point [claim 3].

Nonetheless this feature is well known in the art, and would have been an obvious modification to the apparatus disclosed by Akhmedov, as evidenced by Compton. In an

analogous art, Compton discloses a missing phase detector circuit for use with three phase power sources having three identical detection and pulse forming circuits, each of which has:

A resistive element between the capacitive elements and the first connection point [claim 3] (Figure 2, items 24A –C; Column 3, lines 66 – 68; Column 4, lines 2 – 4). It should be noted that items 24A – C are part of a voltage division circuit, at the input of each detection/pulse forming circuit.

Given the teaching of Compton, a person of ordinary skill in the art at the time of the invention would have readily recognized the desirability of modifying Akhmedov by employing a resistive element between the capacitive elements in an ac voltage divider, as disclosed by Compton, in order to detect phase failures in polyphase alternating current equipment and systems, and for the purposes discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin M. Baldridge whose telephone number is 571 270 1476. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Benson can be reached on 571 272 2227. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Benjamin M Baldridge/
Examiner, Art Unit 4158

/Walter Benson/
Supervisory Patent Examiner, Art Unit 4158